

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A secondary electron detector, especially in a scanning electron microscope, **characterized in that** it is comprised of a sensor (2) located in a detector chamber (3), to which a vacuum pump (10) is coupled to produce a vacuum inside the detector chamber (3), the detector chamber (3) being closed in the wall near to the active surface of the sensor (2) by a diaphragm (11; 12) featuring high resistance to a transmission of gas and a low resistance to a transmission of electrons, while all its remaining walls vacuum-tightly separate the interior of the detector chamber (3) from the surrounding environment, said diaphragm (11; 12) featuring the high resistance to the transmission of gas and the low resistance to the transmission of electrons being constituted by an electrically conductive grid (11) to which at least one source (16, 17) of bias voltage is connected, the low resistance to a transmission of electrons being achieved by electron microlenses inside and in front of each orifice (13) in said diaphragm (11; 12), said electron microlenses being created by an electrical field protruding through said orifices (13), said electrical field originating from a conductive coating (15 and/or 8) inside of the detector chamber (3), where the conductive coating (15 and/or 8) is connected to a voltage source (17 and/or 9).
2. (Original) The secondary electron detector of claim 1, **characterized in that** the electrically conductive grid (11) is made of copper.
3. (Original) The secondary electron detector of claim 1, **characterized in that** the electrically conductive grid (11) is constituted by a diaphragm (12) made of electrically insulating material provided with orifices (13), the diaphragm (12) being fitted with the first conductive coating (14) on the side near to the sensor (2) and with the second conductive coating (15) applied to its reverse side, where the first

conductive coating (14) is electrically insulated from the second conductive coating (15).

4. (Currently Amended) The secondary electron detector of claim 3, **characterized in that** the diaphragm (12) is a ~~polyimide~~ kapton diaphragm.
5. (Currently Amended) The secondary electron detector of ~~any of the foregoing claims 1 to 4~~ claim 1, **characterized in that** the source (16, 17) of bias is a source of bias of 50 to 2000 V.
6. (Original) The secondary electron detector of claim 5, **characterized in that** the source (16, 17) of bias voltage is a source of bias voltage of 250 to 700 V.
7. (Currently Amended) The secondary electron detector of ~~any of the foregoing claims~~ claim 1, **characterized in that** the sensor (2) consists of a light-guide (4), between whose input (6) and the electrically conductive grid (11) an ionization grid (25) is arranged that is connected to the source (26) of ionization voltage, while the light-guide output (4) leads to the photo-multiplier input.
8. (Original) The secondary electron detector of claim 7, **characterized in that** the light-guide (4) is at its input equipped with a scintillator (7), whose surface that is near to the electrically conductive grid (11) is fitted with a conductive coating (8), to which a high voltage source (9) is connected.
9. (Currently Amended) The secondary electron detector of ~~any of the foregoing claims~~ claim 1, **characterized in that** the sensor (2) is constituted by a PIN diode.
10. (Cancelled)

11. (Currently Amended) The secondary electron detector of ~~any of the foregoing~~
~~claims~~ claim 1, **characterized in that** the electrically conductive grid (11) is covered
outside the detector chamber (3) with an input screen (18), which is connected to a
low voltage source (19) of 50 to 500 V.
12. (Original) The secondary electron detector of claim 11, **characterized in that** the
electrically conductive grid (11) is outside the detector chamber (3) covered with an
input screen (18), which is connected to the low voltage source (19) of 80 to 150 V.
13. (Currently Amended) The secondary electron detector of claim 11 [[or 12]],
characterized in that the input screen (18) is of hemispherical shape.
14. (New) The secondary electron detector of claim 12, **characterized in that** the input
screen (18) is of hemispherical shape.